



**Course outline:**  
**An essential guide**

**for**

**BEES6800**

**The Science of Science Communication**

School of Biological, Earth  
and Environmental Sciences

Faculty of Science

Term 1, 2020

## 1. Staff

---

Position	Name	Email
Course Convener	Dr Carol Oliver	carol.oliver@unsw.edu.au
Tutor	Bonnie Teece	b.teece@unsw.edu.au

## 2. Course information

---

Units of credit: 6

Teaching times and locations: **Fully online**

### Course summary

In a world where fake science news threatens our ability to communicate science effectively, being able to apply the art of evidence-based science communication has become an important skill.

The Science of Science Communication course aims to teach science students how to effectively communicate across a range of audiences about why science matters, how it works and its relevance to the way we live our lives.

Students will learn to communicate effectively in a digital age where content is easily accessed but understanding that content is harder to achieve. They will also learn how to measure the effectiveness of their communication of science.

The course is entirely online. *Please ignore any remaining references in the system that suggests this course is anything other than fully online.*

Assessment will be through three connected online assignments that directly address course outcomes. These outcomes include understanding the nature and processes of science, being able to communicate science clearly with multiple audiences in multiple modes, understanding the best use of new and emerging technologies to communicate science, thinking critically and creatively, and knowing how to measure the effectiveness of science communication.

Students need to have completed at least one year of science to take this science elective course. There is no assumed knowledge of science communication. There is no final exam.

There is no compulsory textbook for this year, but you would find it extremely useful to obtain *The Science of Communicating Science* by Dr Craig Cormick, CSIRO publishing (2019). The Kindle version costs \$36.13 and the paperback version is \$49.99. It is highly relevant to the course.

## **Course aims:**

- To introduce students to the steps in communicating science effectively with multiple target audiences from peer to public.
- To develop skills in clearly articulating science in simple language, using powerful visualisation and making appropriate use of new and emerging communication technologies.
- To inspire students to connect audiences with science through storytelling in a personable and meaningful way and to use metaphors and analogy to allow non-experts to understand how science works and why science matters.
- To expose students to the challenges of communicating science to the public and through traditional and social media.
- To provide students with the ability to measure the effectiveness of their science communication initiatives and activities.

This course aims at filling a gap for students who wish to follow careers in scientific research. It may also assist students wishing to apply their scientific expertise to future roles where there is an increasing demand for science communication.

## **Course learning outcomes**

### **The course learning outcomes enable students to:**

1. Apply strategies in communicating science with words, visuals, and in multimedia across multiple types of audiences ranging from peer to public
2. Write concisely, storyboard a presentation, design a good PowerPoint slide deck, present effectively and employ narrative to engage with multiple audiences. Apply these science communication skills to other areas of study, research and in the workplace
3. Communicate scientific uncertainty and the nature of science with the objective of maintaining and gaining public trust in science
4. Apply robust measurement in evaluating the effectiveness of science communication
5. Apply the models of science communication to the practice of science communication
6. Employ the art of knowing the audience, telling a good story, and to do these two things with an achievable, measurable objective in mind
7. Design an effective social media science communication strategy for multiple audiences

## How to be successful in this online course

**NOW:** Treat this course as you would a face-to-face course. Review the course outline carefully and create a work and assignment schedule in relation to your other courses to stay on track. Don't go a whole week without connecting with the course – students who do this generally get low marks or sometimes fail.

**DAILY:** Read any announcements posted in the course.

**DAILY:** Read and respond to any course email messages, within 24 hours.

**ON A WEEKLY BASIS:** plan to spend approximately 10 hours a week completing coursework requirements, including readings. Take notes when reading course materials or watching videos. Research shows that writing notes by hand helps you to reflect more easily on the materials and do better on assignments. Start assignments 2 and 3 at least one week in advance. **You might find making a logbook for the course very helpful.**

**ON A WEEKLY BASIS:** Connect with me, Carol, your instructor if you have any questions in advance of due dates. I am here to help, and I really like to see my students do well !! :)

## Graduate attributes developed in this course

Faculty of Science Graduate Attributes	Level of Focus 0 = No Focus 1 = Minimal 2 = Minor 3 = Major	Related Tasks & Assessment
1. Research, inquiry, and analytical thinking abilities.	3	Evaluation of primary literature; digital literacy through evaluation of information.
2. Capability and motivation for intellectual development.	3	The course is aimed at encouraging lifelong learning. There is no rote learning, no final exam, and all three assignments are aimed at higher-order thinking to develop skills necessary for lifelong learning.
3. Ethical, social and professional understanding.	3	The course contains ethical considerations from what objectivity means in engaging public audiences with the stories of science, particularly in the way information is framed.

4. Communication.	3	Students learn how to be good science communicators – to know their audience, to tell a good story, and to have an achievable, measurable objective in mind.
5. Information literacy.	3	Using primary literature; Using the library and online resources to research science communication literature.

For more information, visit: <https://www.science.unsw.edu.au/our-faculty/science-graduate-attributes>

## Strategies and approaches to learning

---

### Learning and teaching activities

Successful scientists must be effective communicators. They instinctively know how to craft their messages into different shapes for different audiences – from writing a research paper to the creation and presentation of a public talk. These skills are usually learned from lengthy trial and error. This course aims to fill that gap.

The teaching strategy is to focus on engaging students with lifelong learning rather than on rote learning. To avoid the latter, there is no final exam. To encourage the former, the three assignments are the learning opportunities supported by the content of the course.

Students are introduced to the elements of clarity in science communication, including how to write and present effectively, how to use the art of compelling storytelling in science, and the power of visualisation as a framework within which to explore the challenges of communicating science across multiple audiences.

Students explore the nature of science and the public communication of scientific risk and uncertainty. They also learn about models and purposes of science communication, trust and credibility among public audiences and measuring the effectiveness of science communication. These insights are the foundation for the effective communication of science.

Assignments are designed to explore different aspects of science communication. The first assignment encourages students to write about science succinctly by learning how to write a science news story. The second assignment practices the art of storytelling using metaphor or analogy as a way of making science accessible across disciplines and among public and government audiences. In the third assignment, students construct a social media strategy for a research

centre. The latter is to assess student understanding of key the elements of the course, and thus a final exam is not required.

The teaching strategies and rationale are designed to open student minds to multiple ways of communicating science now and in the future. The techniques, strategies and content taught in this course are evidence-based, using both the foundational and most recent research in science communication. This is underpinned with the critical and creative scientific thinking throughout the course to allow students to effectively communicate how science works, why science matters and what its relevance is to our culture and to our society.

Students taking this course should gain enough insight to consider the possibility of a career in science communication to their science degree. Those going onto postgraduate research should be able to present their work more effectively after taking the course, as well as retaining the possibility of a career in science communication.

**Assumed knowledge:** There is no assumed knowledge of science communication but students taking this course must have completed 48 Units of Credit (not necessarily in science) equal to one year of study at the university level.

### **Course activities are:**

**Lessons** – The core content is delivered via short electronic books (e-books) containing text, images and videos fully online and aimed at student comprehension of the key concepts in science communication and to provide students with the tools to communicate science effectively to peer and lay audiences. Students read one or two papers per week to deepen understanding.

**Three assignments** – These assignments are aimed at helping students build confidence in their understanding of science communication. They are all formative as well as summative activities, so should be treated as learning opportunities supported by the course materials.

### **THERE IS NO FINAL EXAM**

Your total course marks out of 100% will be based on:

Three assignments: **A1 = 25%; A2 = 25%; A3 = 50%**

- Assignment 1 includes 5% of the course mark for a reflection piece in Week 1
- Assignment 3 includes 15% of the course mark for an outline of the chosen UNSW research centre and outline of your social media objectives for Assignment 3 in mid-Week 8. Marks and feedback are returned via email to the student before the rest of Assignment 3 (remaining 35% of the mark) is due to assist with final assignment.

## Course schedule and structure

What to do in each week	Topics	What is due this week
<p><b>Week 1</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> <li>• <b>Read the paper on One scientist's struggle to become a better writer and undertake Assignment 1 Part A (5% of the total course mark)</b></li> </ul>	<p><b>Introduction to science communication</b></p> <ul style="list-style-type: none"> <li>• Nature of science communication</li> <li>• Definitions of science communication</li> <li>• Nature, processes and tentativeness of science</li> <li>• Reflective writing</li> <li>• Searching for and using primary literature</li> </ul> <p><b>Forum task</b> (worth 5% of the marks for Assignment 1) Read and reflect on one scientist's struggle to be a better writer</p>	
<p><b>Week 2</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• <b>Submit Assign 1 Part A</b></li> </ul>	<p><b>Communicating science</b></p> <ul style="list-style-type: none"> <li>• Models and the assumptions we make</li> <li>• Where do audiences get science information?</li> <li>• Writing concisely: The six essential questions</li> <li>• Science in the news</li> <li>• Framing of science in public</li> <li>• Dimensions of a science press release</li> </ul>	<p><b>Assignment 1 Part A is due Friday this week at 7pm and is worth 5% of the total course mark: up to 300 words</b></p>

<p><b>Week 3</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e- book and take notes</li> <li>• Watch the videos and take notes</li> <li>• <b>Submit Assign 1 Part B</b></li> </ul>	<p><b>Communication skills</b></p> <ul style="list-style-type: none"> <li>• Know your audience</li> <li>• Tell a good story</li> <li>• Metaphors and analogy</li> <li>• Preparing a presentation</li> <li>• Death by PowerPoint Design</li> <li>• Storyboarding and slide-casting</li> <li>• Overcoming the fear of public speaking</li> </ul>	<p><b>Assignment 1 Part B is due Friday this week at 7pm and is worth 20% of the total course mark: up to 300 words maximum.</b></p>
<p><b>Week 4</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e- book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> </ul>	<p><b>Evidence-based science communication</b></p> <ul style="list-style-type: none"> <li>• The public understanding of science</li> <li>• Scientific literacy versus interest in science</li> <li>• Introduction to evidence-based science communication</li> <li>• Measuring the effectiveness of science communication</li> <li>• Types of science communication activities</li> <li>• Citizen science as a case study</li> <li>• Science communication in museums</li> </ul>	<p>Check Turnitin at the end of this week (Friday after 7pm) for Assignment 1 Parts A and B marks)</p>
<p><b>Week 5</b></p>	<p><b>Communicating science in social media</b></p> <ul style="list-style-type: none"> <li>• Introduction to science communication</li> </ul>	<p><b>Assignment 2 Parts A and B are due Friday this week at 7pm and together are worth 25% of the total course mark. Part A storyboard up to 400</b></p>

<p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> <li>• <b>Submit Assign 2</b></li> </ul>	<ul style="list-style-type: none"> <li>• using social media platforms</li> <li>• The reach of social media platforms</li> <li>• Effective blogging</li> <li>• Using the power of Twitter</li> <li>• Case study in engaging with social media</li> <li>• Elements of creating a social media plan</li> </ul>	<p>words submitted to Turnitin; Part B video 3 mins plus or minus 30 seconds. Marks and feedback for both Part A and Part B will be available in Turnitin at the beginning of Week 7.</p>
<p><b>Week 6</b></p>	<p><b>Flexible week – time to reflect: No new course content or assignments due</b></p>	
<p><b>Week 7</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> </ul>	<p><b>Scientific uncertainty and public trust in science</b></p> <ul style="list-style-type: none"> <li>• Communicating scientific uncertainty</li> <li>• Dimensions of scientific uncertainty</li> <li>• Numbers and statistics</li> <li>• Can views on science be changed?</li> <li>• Communicating risk</li> <li>• Public trust in science</li> <li>• Crisis of public trust (and distrust) in science</li> <li>• Case study: The hill sheep farmers</li> <li>• Negotiating knowledge, attitudes among public audiences</li> <li>• Influencing public trust in science</li> <li>• Measuring public trust in science</li> </ul>	<p>Check Turnitin for your total marks and feedback for Assignment 2</p>
<p><b>Week 8</b></p>	<p><b>Fake science news</b></p> <ul style="list-style-type: none"> <li>• Fake science, junk</li> </ul>	<p>Assignment 3 Part A is due on Wednesday this week at 7pm and is worth 15% of the total course</p>

<p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• <b>Submit Assign 3 Part A</b></li> </ul>	<p>science, or just plain bad science?</p> <ul style="list-style-type: none"> <li>• Climate change</li> <li>• Vaccination: The human cost of fraud</li> <li>• Stem cell controversy and the role of Twitter</li> <li>• Fake documentaries</li> </ul>	<p><b>mark: up to 500 words. Mark and feedback e-mailed to you by Tuesday of Week 9 to assist with Assignment 3 Part B. SUBMIT VIA E-MAIL TO <a href="mailto:carol.oliver@unsw.edu.au">carol.oliver@unsw.edu.au</a></b></p>
<p><b>Week 9</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> </ul>	<p><b>Popularisation, ethics and policymaking</b></p> <ul style="list-style-type: none"> <li>• Star Trek, Star Wars and other science in the cinema</li> <li>• Popularisation of science</li> <li>• Ethics in science communication</li> <li>• Connecting with the policymakers</li> </ul>	<p>Check your UNSW e-mail for marks and feedback on Tuesday this week for Assignment 3 Part A to help with Assignment 3 Part B</p>
<p><b>Week 10</b></p> <p><b>To do this week:</b></p> <ul style="list-style-type: none"> <li>• Read the e-book and take notes</li> <li>• Watch the videos and take notes</li> <li>• Reflect on the e-book content</li> <li>• <b>Submit Assignment 3 Part B</b></li> </ul>	<p><b>Revision and reflection</b> (released with Week 9)</p>	<p><b>Assignment 3 Part B is due on Wednesday this week at 7pm and is worth 35% of the total course mark: 1,500-2,000 words. Part A is intended to be incorporated into Part B, with the benefit of feedback.</b></p> <p>Note that the mark for Part B cannot be released until exams are complete and marks released for other courses.</p> <p><b>**Please fill out the MyExperience survey**</b></p>

## Academic integrity, referencing and plagiarism

**Referencing** is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you paraphrase someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism. This course uses APA referencing style.

Further information about referencing styles can be located at:

<https://student.unsw.edu.au/referencing>

**Academic integrity** is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits:

honesty, trust, fairness, respect, responsibility and courage. <sup>1</sup> At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

<https://student.unsw.edu.au/plagiarism>

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>

**NO LEVEL OF PLAGIARISM IS ACCEPTABLE.** It is your responsibility to check your similarity score in Turnitin after submission. **You will lose marks for 'stringing together' phrases that essentially adds up to copying another author's work.** You may delete your assignment, resubmit, and recheck as many times as you like up to the deadline for submission. Note that Turnitin can pick up references, proper nouns, your name and zID as plagiarised – and in these cases, it is not counted as plagiarism.

### Additional support for students

---

The Current Students' Gateway: <https://student.unsw.edu.au/>

Academic Skills and Support: <https://student.unsw.edu.au/academic-skills>

Student Wellbeing, Health and Safety: <https://student.unsw.edu.au/wellbeing>

Disability Support Services: <https://student.unsw.edu.au/disability-services>

### Virtual Office Hours: Engage with me!

I will be available on Skype between 3pm and 4pm on Tuesdays during Term. My Skype name is carol.oliver42. Just drop in with your questions.

You can also request a one-on-one Skype at a time convenient for you and for me by e-mailing me at [carol.oliver@unsw.edu.au](mailto:carol.oliver@unsw.edu.au).

I am very happy to answer any questions or provide advice via my email address. I am located in Room 5112, Building E26 and also happy to meet face-to-face by appointment.

**You are strongly encouraged to engage with me in relation to the course content and the assignments either one-on-one electronically or in person, or on the course forum (the latter especially if the answer could potentially be useful to the whole class).**

I also strongly encourage ongoing feedback on what you like or do not like about the course, providing it is constructive criticism.

I generally aim to respond to your enquiries with 12 hours and often much sooner, so please feel free to follow up if you do not get a response in that timeframe.

**All correspondence will be via your UNSW student account.**